UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA

SONY MUSIC ENTERTAINMENT, *et al.*,

      Plaintiffs,

v.

COX COMMUNICATIONS, INC., *et al.*,

      Defendants.

Case No. 1:18-cv-00950-LO-JFA

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ATTORNEYS' EYES ONLY
INFORMATION

DECLARATION OF BARBARA FREDERIKSEN-CROSS

      I, Barbara Frederiksen-Cross, hereby declare pursuant to 28 U.S.C. § 1746 that the

following statements are true and correct to the best of my personal knowledge and belief:

Introduction

      1.   I am the Director of Litigation Services at JurisLogic LLC. JurisLogic is an

Oregon corporation that provides consulting services to computer hardware and software

manufacturers and specializes in performing assessments of computer software and software

development projects for the legal profession in the United States, Canada, Japan, Singapore, and

Europe.

      2.   I have been asked by Plaintiffs in this case to provide a technical explanation of

the function of peer to peer ("P2P") file distribution, perform an independent assessment of the

MarkMonitor infringement detection and notification system ("MarkMonitor System"), perform

an independent assessment of the Audible Magic acoustic fingerprinting technology, and

summarize data collected by the MarkMonitor System with respect to the activities of Cox subscribers. I have previously produced expert reports in this case dated April 10, 2019 and June 13, 2019. The observations and conclusions set forth below are based on my own observation and use of the relevant technology, as informed by my specialized knowledge, education, and expertise as applied to the facts and circumstances in this case. If necessary, I would and could competently testify to such observations and conclusions if called as a witness in this matter. I submit this declaration in support of Plaintiffs' Motion for Summary Judgment.

Qualifications

3.   I have over forty-four years of personal experience as a software developer and consultant. My experience includes software design, programming, project management, capacity planning, performance tuning, problem diagnosis, and administration of hardware, operating systems, application software, and database management systems. I have experience working with software platforms and systems used by banks, insurance companies, hospitals, and telecommunication providers. I have been trained in forensic analysis of computer software, and have led independent testing of software systems using BitTorrent software. I have previously qualified as an expert in state and federal courts to testify about the operation of computer software and computer systems, including for other matters that involve P2P file sharing and systems that monitor P2P file distribution and send notices to ISPs based on the activity they detect. A copy of my *curriculum vitae* is attached hereto as Appendix A.

Materials Considered

4.   In addition to my background and experience with the relevant computer systems and technologies as described above, I base my testimony on data sets, documents, and deposition testimony produced in this case. I also have reviewed engineering literature, technical

data, and source code produced by MarkMonitor, Audible Magic, and Cox. Documents cited in this declaration are provided in conjunction with the Gould declaration. A detailed list of the materials I have reviewed and relied upon is included with my expert reports.

5.   This declaration is geared to a general audience. Though I could discuss Internet, P2P, MarkMonitor, and Audible Magic technologies in more precise technical terms, I assume that this level of detail is more useful to the Court.

Background on Internet and Networking Technology

6.   A network is a collection of computers and other electronic devices which are linked together via communication infrastructure that permits them to exchange data.

7.   The Internet is a global network of networks that includes billions of devices worldwide.

8.   An Internet Service Provider ("ISP") is a company that provides its subscribers with access to the Internet. The access may be provided via a variety of technologies, including dial-up telephone connection, cable modem, wireless connection, or dedicated high speed interconnect.

9.   The electronic devices that make up the Internet communicate using a set of communication protocols. One of the most fundamental of these is the Internet Protocol (IP). Numerous other protocols are used in Internet communications, and there is a sense in which they may be layered on top of one another, roughly analogous to the way envelopes may be embedded in other envelopes. These protocols specify how data transmitted between devices should be packaged, addressed, organized, and received. The Transmission Control Protocol (TCP) is a significant protocol commonly used on top of IP.

10.   Part of the IP protocol deals with how messages are exchanged between computers using the Internet. This part of the protocol dictates that messages will have a header that identifies both the sender and the intended recipient, identifying them by their respective Internet Protocol Address ("IP Address"). Electronic devices on the Internet are identified via their IP Address. This address may be static (assigned permanently by the ISP to a particular subscriber) or dynamic (assigned on a temporary basis by an ISP to a particular subscriber). The IP protocol is responsible for transporting the packets, but does not know what application or service is responsible for receiving the packets.

11.   TCP provides the addressing that directs a message to a particular application or service. When devices using the TCP protocol exchange information, they use a port number as a communications end point in addition to the IP address associated with the underlying IP protocol. Each portion of the information exchanged has both a destination and source port number as part of the message header. The port number serves to identify the purpose of a particular data packet (e.g., to identify the data packet as part of a Web page, email, video call, etc.). Slightly more technically, the port number is a means for the packet to reach the proper software application on the receiving computer.

12.   Together the IP address and the port number represent a specific communication channel that allows information to flow between a program such as a web browser running on one computer and a corresponding program such as a website server that is running on some other device on the internet.

Peer to Peer Technology

13.   A P2P network is a defined as a network where each computer on the network can act as both a downloader and an uploader of content directly to the other computers on the

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network. This is in contrast to a system in which computers upload and download files only to

and from and central server. A number of different P2P networks have been developed and

widely used in the last two decades, including the BitTorrent, eDonkey, Ares, and Gnutella P2P

networks at issue in the above-captioned lawsuit. These networks use distinct protocols that

operate on top of the TCP protocol described above, which in turn operates on top of the IP

protocol. P2P networks have different mechanisms for locating, retrieving, and supplying

content. Individuals install P2P client software onto their computer that allows them, when

connected to the Internet, to find, download, and upload content using these protocols.

BitTorrent Terminology and Function

14.   The majority of the notices at issue in this litigation relate to activity on the

BitTorrent network. As a result, I focus on BitTorrent below.

15.   Before a user downloads content from the BitTorrent network, the user must find

a "torrent" file associated with the content; these are available from "torrent" websites that

specialize in their supply. This is accomplished by using a web browser to search sites on the

Internet for such a torrent file or by going to a known torrent site. These torrent files are so

named because they typically have the suffix ".torrent."

16.   A hash value is an alphanumeric representation of the contents of a file that can

be treated as a "digital fingerprint." Hash values are generated using a hash function. BitTorrent

uses a hash function called SHA-1 that was designed by the United States National Security

Agency. Hash functions can be used to identify and authenticate a file's content because two

files with the same hash value will, to a near certainty, have identical contents. As suggested by

its origins, the SHA-1 hash was designed to be very secure. If one were to compare the hash

values for a billion different files, the odds that any two files would have the same SHA-1 hash

value are so incredibly low that they are virtually non-existent.

17.   The torrent file contains two sections: an "announce" section and an "info"

section. The announce section directs the BitTorrent software to a "tracker," a server which

contains IP addresses of BitTorrent users who are distributing pieces of the torrent's content. As

used in the context of BitTorrent, a piece refers to a segmented section of the underlying file or

files being downloaded and distributed. For purposes of this declaration, I will refer to the files

which are distributed through use of a particular torrent as the torrent's content. The info section

contains the names for the file or files of content, the length of those file or files, the length of

each piece of the content, and the hash value for each piece. The torrent is identified by a hash

of its info section; this hash consequently is known as the "infohash," and it plays an important

role in the BitTorrent system.

18.   Once a user has downloaded the torrent file and opened it using BitTorrent

software, the software contacts the tracker and communicates the infohash of the torrent. The

tracker then directs the user's software to BitTorrent peers that are distributing content using the

exact same torrent file, as identified by the infohash. The set of users participating in the

distribution of the torrent content are called a "swarm."

19.   The BitTorrent user's software then initiates connections with other users in the

swarm. In this connection, the user initially discovers which pieces of the content are being

distributed by users participating in the swarm by obtaining "Bitfield data" from other users[1].

Bitfield data is information provided by the peer that shows exactly which pieces of the content

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[1] After the initial bitfield information is obtained, the Peers may also exchange "have" messages to identify
additional pieces they have downloaded and verified.

the peer has downloaded and verified. The BitTorrent software then requests and downloads pieces of the content from others in the swarm.

20.   As described above, as each piece of the content is downloaded, the BitTorrent software calculates a SHA-1 hash value of the downloaded piece and compares it to the corresponding piece hash value found in the torrent file's info section. If the values match, the BitTorrent software updates its Bitfield data to indicate that it has the full piece. As the user downloads pieces from others, verified pieces downloaded are also distributed to other users which have requested them.

21.   The user's BitTorrent software continues to request and download pieces until it has every piece of the content and every piece has been verified by hash. The pieces are then reconstituted into the file or files that make up the torrent content.

22.   The BitTorrent protocol is designed with a "tit for tat" model. This means that users are incentivized to distribute content as they are downloading. As soon as a user has a piece of a torrent's content, the user becomes a source for distribution of that piece to other users. This means that users who have the BitTorrent software running on their computer will be both distributing and downloading content (except the user who has already downloaded all the pieces no longer downloads because they already have the complete file). BitTorrent penalizes users who do not distribute content, for instance by throttling their download speeds. Conversely, BitTorrent rewards peers that are active distributors with preferential speeds.

Other P2P Protocols

23.   While the specific hash algorithm varies, all of the P2P protocols at issue in this litigation use hash value matching to uniquely identify content being distributed on their networks and to verify the content was successfully downloaded. The three other P2P protocols

at issue in this litigation are overviewed below, highlighting some of their differences from

BitTorrent.

24.   Ares is a decentralized P2P network that does not use torrent sites or tracker

servers. Instead, certain users within the Ares network provide keyword search capabilities.

These users are called "Super Nodes," and users can submit queries to these Super Nodes to

identify peers that are distributing sought content. After the requesting user receives information

about the peer distributing the sought file, the peer with the file and the requesting user

communicate directly.

25.   Gnutella is also a decentralized P2P network that does not use torrent sites or

tracker servers. Users within the Gnutella network provide indexing and keyword search

capabilities. These users are called "Ultra Peers." An Ultra Peer receives search queries from

users, searches its own index of files, and also forwards the query to other Ultra Peers and certain

peers to which it is connected. The Ultra Peer sends back the search results to the requesting

peer, including information about files that match the query and the users distributing those files.

26.   eDonkey is a P2P protocol that supports both server-based and distributed

keyword searches for content. In the place of torrent sites and trackers, central eDonkey servers

host a file index and support searches submitted from users, relaying back information about

files that match search terms and the users who are distributing those files. eDonkey also

supports the use of Distributed Hash Table technology to spread the eDonkey server function

among ordinary peers, so that the system works even without eDonkey servers.

The MarkMonitor System Overview

27.   I understand that MarkMonitor was retained by the RIAA on behalf of Plaintiff

recording companies to monitor the BitTorrent, Ares, Gnutella, and eDonkey P2P networks for

copying and distribution of specified sound recordings. I further understand that notices sent to Cox at issue in this litigation were generated by the MarkMonitor system based on activity it observed on the P2P networks.

28.   My review of the MarkMonitor system included conducting an independent analysis of the source code for the software that MarkMonitor used to interact with P2P file distribution networks, collect evidence and send notices. I interviewed MarkMonitor personnel and reviewed MarkMonitor's deposition testimony. I also examined data collected and stored by MarkMonitor relating to the activities of Cox subscribers and notifications sent to Cox concerning these activities, including documents produced electronically in discovery as Plaintiffs_00286431, Plaintiffs_00286430, and a collection of ███████ evidence case files.

29.   Based on my review, the MarkMonitor System is comprised of ████████

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33.   Because of the decentralized nature of a P2P network, it is impossible for

MarkMonitor, or any other P2P user, to track a peer's activity with other peers. This is true

because any particular peer can only see the activity it is engaged in, not the activity that is

occurring between other peers. Only an entity like an ISP, which provides the bandwidth on

which the distribution takes place, is in a position to potentially track P2P downloading and

distribution between third parties. It is my understanding that Cox does not ████████████

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████████████████████████████████Only the ISPs records can determine

which customer account was using a particular account at a particular time.

Audible Magic Technology Overview

35.   Audible Magic is an acoustic fingerprinting software that was used, ████████

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[2] As described in more detail below, in a few hundred instances out of the hundreds of thousands
of notices at issue in this litigation, the amount of the content shared by the user was less than
ninety percent. *See infra*, ¶ 42.

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36.   My review of the Audible Magic technology included Audible Magic

documentation and deposition testimony, an interview with Audible Magic's Chief Scientist, and

a review of the Audible Magic source code. In addition, my review included a "test drive" of

the Audible Magic software. To conduct this review, I used copies of the same files that

MarkMonitor observed Cox subscribers downloading and/or distributing and that were identified

in infringement notices to Cox. I obtained those files from a hard drive of files that

MarkMonitor provided to Plaintiffs, which has been produced in discovery and designated PX

39. I submitted a small sample of files to Audible Magic and received a positive identification

on all of them. Thereafter, I confirmed the accuracy of the identification by listening to the submitted file and the identified authentic song available through iTunes.

37.   In the context of Audible Magic's technology, a false positive would be defined as a case in which Audible Magic incorrectly identifies the sound recording contained in a file. In discussions with Audible Magic's Chief Scientist, my review of Vance Ikezoye's deposition transcript, and review of Audible Magic's documentation and source code, it appears that this false positive rate is exceedingly small and almost non-existent. This makes sense because Audible Magic's technology compares representations of the acoustic characteristics of the sound recordings and is configured conservatively to avoid any false positives. Audible Magic has indicated that back in 2013-2014 it processed roughly ███████████████████, with perhaps one false positive reported per year.

Evidence and Analysis

38.   In connection with reviewing the MarkMonitor System, I conducted an analysis of several bodies of evidence collected during the verification and notice generation process. I reviewed a document produced in discovery as Plaintiffs_00286430 in the form of a text file and Plaintiffs_00286280 or PX 14, in the form of an Excel spreadsheet. This spreadsheet contains a record of ██████ notices sent by MarkMonitor to Cox between January 2, 2012 and March 31, 2015. I understand this document to be ███████████████ kept by MarkMonitor in its normal course of business.

39.   I also reviewed a document produced in discovery as Plaintiffs_00286431, PX 11. I understand this document to be ████████████████████████████████

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███████████████████████. I understand this document to be ████████████████ kept by

MarkMonitor in its normal course of business.

40.   I have also reviewed a collection of ████████ evidence packages related to notices

at issue in this litigation between that were produced as MM000306 and designated PX 33.

These evidence packages take the form of ████████████████████████████████████

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41.   I analyzed the evidence packages produced as MM000306. I observed ██

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43.   Finally, I conducted an analysis of the ████████████████████████████

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Executed in Hubbard, Oregon this 29th day of August, 2019

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony

Barbara A. Frederiksen-Cross

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Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony   Qualifications: 1

Qualifications

Education and Experience

Barbara Frederiksen received her basic education at American public schools and completed her High School education at Chemeketa Community College, at the age of sixteen.

She continued her education there, receiving an Associate of Applied Science degree in Computer Programming in 1974 at the age of eighteen.

Since then, she has continued her professional education with technical training from IBM, Amdahl, Hitachi Data Systems, Verhoef, SAS Institute, Merrill Consultants, Microsoft, and other education providers. This education has included advanced training in operating system internals, telecommunication system internals, database internals, diagnostics, system performance engineering, storage management, capacity planning, and data recovery.

Ms. Frederiksen has 44 years' experience in the computer industry and has held positions as, in chronological order: mainframe and midrange applications programmer; system analyst; software development consultant; programming instructor (developing courses in CICS, OS JCL, and VSAM internals); database administrator; systems programmer (problem diagnosis, maintenance and customization of mainframe operating system software and other software products); system performance specialist (for batch, on-line, and database systems); regional manager for a software consulting service provider; operating systems software developer (developing software to enhance the performance of mainframe computing systems); systems programmer (performing hardware planning and performance evaluation, system tuning, network tuning, disaster recovery planning, and managing data availability policies and procedures); systems programmer (responsible for problem resolution, software installation, and system maintenance for mainframe and midrange systems); UNIX system administrator; capacity planner (monitoring business metrics, sales forecasts, computer system performance, directing tuning efforts, and planning upgrades for MVS, AS/400, NCR 3600, Teradata, UNISYS, and UNIX systems); and forensic software analyst.

Ms. Frederiksen was team leader for the storage management/capacity planning team of a fortune 100 company for over three years, responsible for software, robotic tape libraries, management policies, and automated processes used to backup and recover global enterprise computer systems. In this capacity she also developed complex mathematical models to analyze and predict computer performance and capacity demands for national, regional, and global computer operations.

Since 1996 Ms. Frederiksen has worked in the field of computer forensics, first as a consultant to Johnson-Laird Inc. ("JLI"), of Portland, Oregon and now as the director of litigation services for its successor company, JurisLogic, LLC.

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony	Qualifications: 2

Ms. Frederiksen has performed forensic software analysis for a variety of clients in over 100 civil and criminal matters. These matters include forensic software analysis in the context of copyright, patent, and trade secret disputes. She has analyzed computer software and source code in the context of over 40 Copyright/Trade Secret disputes. Her analysis experience with respect to these matters includes the evaluation and comparison of computer source code and object code to detect copying and derivative works, identification of third party and open source materials, analysis of architectural and other non-literal similarities, and analysis of computer source code to determine whether it incorporates or makes use of specific trade secrets. Copyright and Trade Secret clients include companies such as Caterpillar, Computer Associates, Compuware, FOREX Capital Markets, LexisNexis, iGPS, ProvoCraft, Symantec, and Webtrends.

Ms. Frederiksen has also analyzed computer software, source code, or prior art in the context of over 35 patent disputes with respect to both infringement and validity analysis. Her analysis experience with respect to these matters includes analysis to determine how software functions and whether it practices the specific invention claimed in the patent(s) in suit. She is also experienced in the analysis of computer software that may constitute prior art for litigated patents and analysis of the development history of computer software with respect to on-sale bar issues. Patent clients include companies such as Active Video Networks, Connectix Corporation, Encyclopaedia Britannica, Grantley Patent Holdings, Herman Miller, Hyundai, In-Three, Microsoft, MPI Technologies, Pitney Bowes, Siemens-Rolm, Teknowledge Corporation, and University of Pittsburgh.

Ms. Frederiksen has over 44 years personal experience as a software developer and consultant, and is familiar with licensing and contract practices common in the software industry as they apply to software consulting agreements, custom development, software licensing, and the sale of computer software. In the course of her career she has been responsible for negotiating consulting agreements and custom software development agreements as both a consultant and as a consumer of those services. She has been responsible for negotiating software license agreements for a fortune 100 company and also personally as both a licensee and licensor in such agreements. She has also developed software products and negotiated contracts for their subsequent sale.

Ms. Frederiksen has specialized knowledge of the analysis and remediation of failed software development efforts. She has been involved in software system audits performed by the State of Alaska, as well as forensic analysis relating to contractual disputes and litigation relating to failed software development efforts, licensing disputes, and the deployment and performance of software systems. As a forensic analyst, she has analyzed computer software, source code, and related computer-based evidence in the context of nine Software Licensing and Software Development disputes and three internal investigations relating to due-diligence for software acquisitions.

Ms. Frederiksen also has over five years experience with the oversight and evaluation of clean room procedures used for software development. This experience includes the development of clean room protocols and clean-room oversight, as well as actual experience programming in a clean room environment.

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony   Qualifications: 3

In the context of her work for JLI and JurisLogic, Ms. Frederiksen has developed, reviewed, and critiqued clean room protocols; prepared educational presentations on clean room procedures and protocols for JLI clients; assisted with clean room set-up and oversight; and evaluated software that was developed using clean room protocols to determine whether it was free of inappropriate materials. She has also provided testimony at arbitrations and hearings in the United States and Canada relating to clean room development procedures and protocols.

Ms. Frederiksen has experience in the design, implementation, and ongoing administration of databases and multi-dimensional data aggregation systems used to support business analysis, performance reporting, cross-system data sharing, and ad-hoc decision support queries. She has specific experience with the design, programming, tuning, and administration of the hardware, software, and underlying database management systems implemented to support batch and on-line query and update systems, data warehouses, and data marts. She has developed and written application software used to allow users to manipulate and analyze data using pre-defined reports and ad-hoc queries as well as software used in the context of high-volume real time transaction and messaging systems. This experience includes special training from professional organizations such as CMG, and over ten years experience in the evaluation, modeling, and tuning of hardware and software systems' performance and capacity.

She is experienced in the recovery, preservation, and analysis of computer-based evidence. Ms. Frederiksen has assisted with discovery and analysis of computer software and computer-based evidence relating to large scale product liability investigations such as the Vioxx, Propulsid, Rezulin, and Ford/Firestone matters. She has also provided forensic analysis in civil and criminal investigations relating to unauthorized computer access, sabotage, internet trespass, spyware deployment, evidence tampering, and identity theft; as well as analysis performed in the context of internal software audits, acquisitions, and internal investigations relating to employee conduct.

Ms. Frederiksen has provided evidence recovery and analysis in criminal cases for the FBI and for the defense in *State of California v. Saghari*. She was a police reserve specialist with the Hillsboro Police department 2002-2009, assisting in criminal investigations involving computer-based evidence.

Papers and Presentations

- "*Prognostications on the Response of the Law to Technological Advances*" panel participant; Oregon State Bar Emerging Technologies-Charting the Future Course of the Law, Tigard, Oregon, October 12, 2018

- "*Cyber Liability from the Trenches: A Front Line Perspective*" (co-authored with Melissa Ventrone of Wilson Elser) Oregon State Bar Navigating the Pitfalls of an Online Business Presence-What Your Clients Need to Know, Tigard, Oregon, September 27, 2013

- "*Drones – A Culture of Fear*" District Of Oregon Conference Innovations in the Law: Science and Technology (joint effort of the US Court for the District of

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony   Qualifications: 4

Oregon and the Oregon chapter of the Federal Bar Association), Portland, Oregon, September 20, 2013

- "*How Development Advances Put Security in Retreat*" NW ISSA Security Conference, Portland, Oregon, May 2, 2013

- *"Women in Computing"* Washington State University, Vancouver campus, Vancouver, Washington, March 28, 2011

- *"Open Source Issues in Mergers & Acquisitions"* (co-authored with Katherine C. Spelman, Esq.) Open Source & Security Cincinnati Intellectual Property Law Association (OSS3); Erlanger, Kentucky, October 27, 2011

- *"Reverse Engineering: Vulnerabilities and Solutions"* (co-authored with Susan Courtney) Pacific Northwest Software Quality Conference, Portland, Oregon, October 11, 2011

- *"Basic Computer Forensics (a lesson in modern Geek)*" Santa Clara Public Defenders' Office, San Jose, California, October 26, 2010

- *"Quality Pedigree Programs: Or How to Mitigate Risk and Cover Your Assets"* (co-authored with Marc Visnick and Susan Courtney) Pacific Northwest Software Quality Conference, Portland, Oregon, October 18, 2010

- *"Third Party Code Beware the Trojan Source!"* co-authored with Katherine C. Spelman, Esq., American Bar Association Section of Intellectual Property Law Landslide® Magazine, "in press"

- *"Finding the Snipers and Preserving the Evidence"* Oregon State Bar, Computer & Internet Law Section, Portland, Oregon, September 17, 2010

- *"Challenges in Corporate Forensics – Why Isn't Bigger Better?"* panel participant Digital Forensic Research Workshop (DFRWS), Portland, Oregon, August, 2010

- *"Beware of Geeks Bearing Gifts, Beware The Trojan Source!"* (co-authored with Kate Spelman, Esq.) University of Dayton School of Law: Significant Developments in the Intellectual Property Law of Computers and Cyberspace Conference, Dayton, Ohio, June 11, 2010

- *"Hack to the Future"* NW ISSA Security Conference, Portland, Oregon, May 6, 2010

- *"e-Discovery: Size Matters"* Oregon State Bar, Computer & Internet Law Section meeting, Portland, Oregon, February 23, 2010

- *"Software Pedigree Analysis: Trust But Verify"* (co-authored with Marc Visnick and Susan Courtney) Pacific Northwest Software Quality Conference, Portland, Oregon, October 28, 2009

- *"e-Discovery: Size Matters"* University of Dayton School of Law: Significant Developments in the Intellectual Property Law of Computers and Cyberspace Conference, Dayton, Ohio, June 12, 2009

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony   Qualifications: 5

- *"The Digital Detective: Looking for Evidence on Electronic Devices"* Portland State University, Mathematics Engineering Science Achievement (MESA) Conference, Portland, Oregon, April 11, 2009

- *"Computer Forensics in Civil Litigation"* Washington State University Vancouver, School of Engineering & Computer Science, Vancouver, Washington, April 7, 2009

- *"Discovering Electronic Evidence"* Tulane University Law School, New Orleans, Louisiana, March 18, 2009

- *"E-Discovery: A Survival Guide"* Tulane University Law School, New Orleans, Louisiana, March 16, 2009

- *"New Technology, New Challenges"* University of Dayton School of Law: Significant Developments In Computer & Cyberspace Law Convention, Dayton, Ohio, June 6, 2008

- *"Electronic Forensics - Today and Tomorrow "* Washington State University Vancouver, School of Engineering & Computer Science, Vancouver, Washington, April 1, 2008

- *Will Peer-to-Peer Disappear?* The Berglund Center for Internet Studies at Pacific University of Oregon, Forest Grove, Oregon, February 19, 2008

- *"Computer Forensics"* panel participant Portland Society for Information Management, Portland, Oregon, November 14, 2007

- *"Tuned In, Turned On, Spaced Out: How Technology is Changing Our Communities and Shaping Our Future"* panel participant Hillsboro Town Hall (Pacific Institute for Ethics and Social Policy), Hillsboro, Oregon, October 25, 2007

- *"Basic Computer Forensics (a lesson in modern Geek)"* Santa Clara Public Defenders' Office, San Jose, California, October 23, 2007

- *"Obtaining & Using Electronic Evidence"* panel participant 2007 National Employment Lawyers Association (NELA) Eighteenth Annual Convention, San Juan, Puerto Rico; June 27-30, 2007

- *"Where Are We Allowing Technology to Lead Us?"* University of Dayton School of Law Significant Developments In Computer & Cyberspace Law Convention, Dayton, Ohio, June 8, 2007

- *"Where Are We Allowing Technology to Lead Us*?" Computer Related Investigations, Management, and Education (CRIME), Hillsboro, Oregon, May 16, 2007

- *"Where Are We Allowing Technology to Lead Us?"* Keynote Address, International Technology Law Association Annual Meeting & World Conference, Chicago, IL; April 26-27, 2007

- *"The Law Firm's E-Data: A Risk Management Nightmare?"* panel participant 2007 Legal Malpractice & Risk Management Conference, Chicago, IL; March 6-9, 2007

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony   Qualifications: 6

- *"Computers and Disaster Planning: What Can We Learn from Katrina and SARS?"* Cutting Edge Issues in Technology Law, Seattle, WA, December 7-8, 2006

- *"Phishing, Pharming, & Wholesale Data Harvesting"* University of Dayton School of Law Significant Developments In Computer & Cyberspace Law Convention, Dayton, Ohio, June 9, 2006

- *"Lessons Learned From Katrina, SARS, and Other Disasters"* University of Dayton School of Law Significant Developments In Computer & Cyberspace Law Convention, Dayton, Ohio, June 9, 2006

- "*e-Discovery and the Proposed Federal Rules of Civil Procedure (FRCP) Changes - How Safe Is The Safe Harbo*r?" Cooley Godward LLP, San Diego, California, March 2, 2006

- "*Proposed Changes To Rule 26: A New Game?"*, Oregon State Bar, Business Litigation Continuing Legal Education, Portland, Oregon, November 9, 2005

- "*A View from the Witness Stand,*" Computer Related Investigations, Management, and Education (CRIME), Portland, Oregon, September 7, 2005

- "*The Technology of Electronic Discovery*" Tulane Law School, New Orleans, Louisiana, April 20, 2004

- *"Preserving Documents and Data",* Association of Trial Lawyers of America, Case Management and Electronic Discovery in Pharmaceutical Litigation, Dallas, Texas, March 7–8, 2003

- *"Documents, Databases, Discovery and the Damned",* University of Kentucky College of Law 4th Annual Computer & Technology Law Institute, Lexington, Kentucky, November 1-2, 2002

- "*Forensic Software Analysis (electronic discovery)*", Louisiana State Bar Association – Mass Torts Symposium, New Orleans, Louisiana, October 25, 2002

- "*eDiscovery – The Role of an Expert*", Computer Related Investigations, Management, and Education (CRIME), Portland, Oregon, October 8, 2002

- *"Working with Experts"* (panel member), Computer Law Association, Orlando, Florida, October 3, 2002

- "*Efficient Discovery Through the Use of Technology*" Association of Trial Lawyers of America (ABTL), Atlanta, Georgia, July 20-24, 2002

- *"The Technology of Discovery Issues"* University of Dayton School of Law Advanced Computer and Cyberspace Law Convention, Dayton, Ohio, June 7, 2002

- "*Beyond Common Experience - Persuading the Jury with Expert Testimony Mini-Seminar*" panel participant and software expert, Association of Business Trial Lawyers (ABTL), San Diego, California, May 11, 2002

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Curriculum Vitae, Qualifications, Testimony	Qualifications: 7

- *"Computer Searches and Seizures: Some Unresolved Issues,"* <u>8 Mich. Telecomm. Tech. L. Rev. 1</u> (2002), Susan W. Brenner and Barbara Frederiksen, available at http://www.mttlr.org/voleight/Brenner.html

- *"Information Technology Basics"* Sixth Annual CyberSpace Camp Conference, San Jose, California, February 14-16, 2002

- *"Emerging Issues in CyberSpace: Regulations without Borders and Borders without Regulations"* University of Calgary Faculty of Law, Alberta, Canada, February 6, 2002

- *"Evidence in the Age of Electrons"* Guest Lecturer, Professor Davis's Internet Litigation LLM course, Santa Clara University School of Law, Santa Clara, California, November 17, 2001

- *"Tunnel Blindness: Insecurity and the Internet"* Oregon State Bar Continuing Legal Education Computer Law in the New… new <u>E</u>conomy, Portland, Oregon, November 2, 2001

- *"Forensic Software Analysis: Smoking Guns and Spinning Disks Redux"* Louisiana State Bar Class Action/Mass Torts Symposium 2001, New Orleans, Louisiana, October 26, 2001

- "*Beyond Common Experience - Persuading the Jury with Expert Testimony*" panel participant and software expert, Association of Business Trial Lawyers (ABTL), LaQuinta, California, October 12-14, 2001

- "*Tools and Techniques for Forensic Analysis.*" 2001 Federal Public Defenders Computer Systems Administrator Conference, San Diego, California, June 12, 2001

- *"Technologies for Data Collection and Snooping."* University of Dayton School of Law Computer and Cyberspace Law Convention, Dayton, Ohio, June 8, 2001

- "*New Technologies and the Legal Issues They Raise.*" University of Dayton School of Law Computer and Cyberspace Law Convention, Dayton, Ohio, June 8, 2001

- "*Records Retention, Privacy, and the Age of Electrons.*" Financial Women's Association, Silicon Valley Conference, San Francisco, California, March 2001

- "*Managing The Mountain -- Strategies For Computer Based Evidence.*" Clifford Chance, In-house conference, London, England, March 2001

- "Managing The Mountain -- Strategies For Computer Based Evidence." The Computer Law Association European CyberSpaceCamp Conference, Amsterdam, the Netherlands, March, 2001

- "What You Need to Know About Domain Names: Introduction and Overview." Domain Name Protection, Litigation & Management Summit, San Francisco, California, February 2001

- "Computer Based Evidence: Strategies To Manage The Mountain" Herman Middleton, New Orleans, January 2001

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Curriculum Vitae, Qualifications, Testimony   Qualifications: 8

- ALI-ABA Trial Of A Software Patent Case: Panel participant and software expert presenting video taped testimony for the mock trial. Chicago, Illinois, September 2000

- *"The ABCs of CBE (Computer-Based Evidence)."* Oregon Criminal Defense Lawyers Association, Bend, Oregon, June 2000

- *"New Technologies: New Challenges for the Law"* (Paper co-authored with Andy Johnson-Laird, William R. Trost), Dayton Law Journal, June, 2000

- *"Computers and the Law: Collaboration or Collision?"* (Paper co-authored with Andy Johnson-Laird, William R. Trost), The Second Annual Symposium On Information Technology And Cyberspace Law, May, 2000 (Osgoode Hall Law School of York University, Toronto, Canada)

- "Electronic Evidence (Too Much of A Good Thing?)" Santa Clara County Bar Association, May, 2000 (CLE)

- "Bringing Your Story Home: Technology In The Courtroom" Willamette University College Of Law, May 2000

- *"Computer Based Evidence – The ABCs of CBE"* Willamette University College of Law, April, 2000

- "*Making Sense of Electronic Evidence*" Conference For Federal Defender Administrators And Computer Systems Administrators, April, 2000

- FJC Mini Conference on Discovery of Computerized Information, Hastings College Of Law, March, 2000

- "*Techno-Archeology™ - The Analysis of Failed Software Development*" Lane Powell Spears Lubersky, November, 1999 (CLE)

- *"Y2K Incoming! – Preserving Evidence For The Inevitable"* Oregon State Bar, Computer Law Section, November, 1999 (CLE)

- *"The Preservation and Analysis of Computer-based Evidence,"* Powell, Goldstein, Frazer & Murphy, August, 1999 (CLE)

- *"Forensic Software Analysis: Preservation Discovery and Analysis of Computer-based Evidence,"* Computer Related Investigations, Management, and Education (CRIME), April 13, 1999

- *"Forensic Software Analysis: The Preservation and Analysis of Computer-based Evidence,"* Miller, Nash, Wiener, Hager & Carlsen, February, 1999

- "*A Silent Chorus – The Relevance of Electronic Evidence,*" Willamette University College of Law, Internet Law Caucus, November 1998

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Curriculum Vitae, Qualifications, Testimony	Qualifications: 9

Expert Testimony

Court Appointed Expert

Court Data System Advisor to the Honorable Marvin J. Garbis, in the U.S. District Court for the District of Maryland, in the matter of *Vaughn G., et al. v. Walter G. Amprey, et al.*, Civil Action No. MJG-84-1911.

Trial Testimony

- Admitted as an expert in forensic software analysis, software design, and reverse engineering in the US District Court for the Eastern District of New York, *Point 4 Data Corporation and Dynamic Concepts Inc. v. Tri-State Surgical Supply & Equipment Ltd., SJ Computers, Inc. and Shmuel Judkovitz*; Case No. 11-cv-0726 (RJD); August 2018 (Engaged by plaintiffs for software analysis).

- Admitted as an expert in the areas of computer forensics and source code analysis in the US District Court for the Northern District of Texas Dallas Division, *Zenimax Media Inc. and ID Software LLC v. Oculus VR, LLC, Palmer Luckey, and Facebook, Inc.,* Case No. 3:14-cv-1849-K; January 2017 (Engaged by Oculus (defendant) for software analysis in the context of a copyright suit).

- Admitted as an expert in the areas of forensic software analysis and software design, development and programming in the US District Court for the District of Puerto Rico, *Puerto Rico Treasury Department v. OPG Technology Corp., et al.,* Case No. 3:15-cv-03125 (JAG) August 2016 (Engaged by OPG Technology Corp (defendant) for software analysis in the context of a copyright suit).

- Admitted as an expert in computer programming and computer forensics in the US District Court for the Eastern District of Virginia, *BMG Rights Management (US) LLC, and Round Hill Music LP v. Cox Enterprises, Inc., Cox Communications, Inc., Coxcom, LLC*, Case No. 1:14-cv-1611 (LOG/JFA) December 2015 (Engaged by BMG Rights Management (plaintiff) for source code related analysis in the context of a copyright suit.)

- Admitted as an expert in software investigation in the US District Court for the Northern District of California San Francisco Division, *Fujifilm Corporation v. Motorola Mobility LLC*, Case No. C12-03587 RS; April 2015 (Engaged by Fujifilm (plaintiff) Corporation for source code analysis related to accused software in the context of a patent infringement suit)

- Admitted as an expert in computer science, source code, and software development in the US District Court for the District of Delaware, *Finjan, Inc v. Symantec Corp., Webroot Software, Inc. Websense, Inc. and Sophos, Inc.*, Civil Action No. 10-593-GMS; December 2013. (Engaged by Websense, Inc. for source code analysis related to accused software in the context of a patent infringement suit.)

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Curriculum Vitae, Qualifications, Testimony   Qualifications: 10

- Admitted as an expert to provide testimony about video data in the District Court of Bexar County, Texas, 407th Judicial District, *Karen D. Griffin, individually and Virginia L. Brunner, as next of friend of Karen D. Griffin v. Union Pacific Railroad Company, Kenneth Piper and Gary Anderson*, Cause No. 2010-CI08523; March 2012 (Engaged by the plaintiff, discovery issues and analysis relating to analysis of electronic Track Image Recorder Video files.)

- Admitted as an expert in computer software in the US District Court for the Eastern District of Virginia, Norfolk Division**,** *ActiveVideo Networks, Inc. v. Verizon Communications, Inc. Verizon Services Corp., Verizon Virginia, Inc. and Verizon South, Inc.***,** Civil Action No. 2:10-cv-248; July 2011. (Engaged by ActiveVideo Networks for source code analysis related to accused devices in the context of a patent infringement suit.)

- Admitted as an expert in software engineering in the U.S. District Court for the Eastern District of Texas, Tyler Division, *Clear With Computers, LLC. v. Hyundai Motor America, Inc.*, Case No. 6:09-cv-479 LED; June 2011. (Engaged by Hyundai Motor America, Inc. for invalidity analysis in the context of a patent infringement suit.)

- Admitted as an expert in computer based evidence in *The People of the State of California v. Jason Cai,* Superior Court of the State of California, for the County of Santa Clara, Case No. CC810427; July 2010. (Engaged by counsel for defendant in a homicide matter)

- *Bill Fraser, Soo Min Fay, Doug Frosch, George Marshall, Cal Mitchell, Jim Rubino, Tim Shea, John Sullivan, and Steve Munson v. Valley Energy Investment Fund U.S., L.P., Vulcan Investment Holdings, LLC, Denham Commodity Partners Fund V LP, Denham Capital Management L.P., Merrill Lynch Commodity Partners, LLC, Scott Mackin, David Owens, Rod Wimer, Robert Warburton, Todd Bright, Robert Jones, and Vulcan Power Company,* Circuit Court for the State of Oregon, Lane County, Case No. 160826841; June 2010. (Engaged by Plaintiffs to assess whether discovery costs incurred by Defendants were reasonable in the context of case fact pattern.)

- Admitted as expert in evidentiary hearing In the Circuit Court of the 11th Judicial Circuit, In and For Miami-Dade County, Florida, General Jurisdiction Division, *Jarrell Cannon a minor by and through his mother and natural guardian, Alicia Lott, and Alicia Lott, individually v. Ford Motor Company, and Hazel Edgecomb*, Case No. 05-21648 CA20; May 2009 (Engaged by plaintiffs in the context of technical issues in discovery)

- Admitted as an expert in the District Court of Tarrant County, Texas, discovery hearing, *Estate of Dwayne Freeto, et al. v. Ford Motor Company and Scott Hilburn*, Case No. 348-233429-08; March 2010. (Engaged by the Estate of Dwayne Freeto, et al., discovery issues and analysis relating to electronic data.)

- *CollegeNet, Inc. v. XAP Corporation*, U.S. District Court for the District of Oregon, Case No. 03-1229-BR; June 2008 (Engaged by XAP Corporation, analysis of inequitable conduct during patent prosecution.)

Barbara Frederiksen-Cross

Curriculum Vitae, Qualifications, Testimony   Qualifications: 11

- Admitted as an expert on software analysis in *Grantley Patent Holdings, Ltd. v. Clear Channel Communications, Inc., et al.*, Case No. 9:06cv259; April, 2008 (Engaged by Grantley Patent Holdings, Ltd., patent infringement/validity.)

- Markman hearing in *Grantley Patent Holdings, Ltd. v. Clear Channel Communications, Inc., et al.*, Case No. 9:06cv259; October 2007 (Engaged by Grantley Patent Holdings, Ltd.)

- Admitted as a software expert in *Ricoh Corporation and Ricoh Company, Ltd. v. Pitney Bowes, Inc.*, Case No. 02-5639 (GEB); November 2006 (Engaged by Pitney Bowes Inc., patent infringement/validity.)

- Admitted as an expert on software analysis *CollegeNet, Inc. v. XAP Corporation*, U.S. District Court for the District of Oregon, Case No. 03-1229-BR; September 2006 (Engaged by XAP Corporation, patent infringement/validity.)

- Admitted as an expert on computer software development, clean room procedures, and database in *HotSamba, Inc. v. Caterpillar, Inc.*, U.S. District Court Northern District of Illinois Eastern Division, Case No. 01-C-5540, September 2006 (Engaged by Caterpillar Inc., copyright/licensing dispute/breach of contract.)

- Admitted as an expert on software development and the recover and analysis of computer based evidence in *Compuware Corporation v. International Business Machines Corp.*, United States District Court for the Eastern District of Michigan, Case No. 02-70906, March, 2005 (Engaged by Compuware Corporation to perform analysis of computer based evidence relating to copyright/trade secret issues.)

- Admitted as an expert on the analysis of computer based evidence in *Norman B. Feaster et al. v. CSX Transportation, Inc.*, Franklin County Circuit Court Case No. 10,913-CV, November 2002 (Engaged by Norman B. Feaster, et al, railroad case involving analysis of locomotive event recorder data.)

- Admitted as an expert on recovery and analysis of computer based evidence in *Bridgestone/Firestone, Inc., ATX, ATX II, and Wilderness Tires, Products Liability Litigation*, United States District Court Southern District of Indiana Indianapolis Division Court Case No. IP00-9373-C-B/S MDL No. 1373, February 2002 (Engaged by Plaintiffs' Litigation Committee, discovery issues and analysis relating to electronic data.)

- Admitted as an expert on computer software and the analysis of computer based evidence in *United States of America v. Santee Sioux Tribe of Nebraska*, United States District Court for the District of Nebraska, Case No. 8:96CV367, October, 2001 (Engaged by Santee Sioux Tribe of Nebraska, analysis relating to the software used for operation of computer controlled gaming devices.)

- Admitted as an expert on recovery and analysis of computer based evidence in *Tim O'Neil v. Levi Strauss and Company et al*, Superior Court of California, Case No. 221466, February, 2001 (Engaged by Levi Strauss and Company, recover and analyze computer based evidence.)

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Curriculum Vitae, Qualifications, Testimony   Qualifications: 12

- Admitted as an expert on recovery and analysis of computer based evidence in *State of California v. Bahram Saghari,* Superior Court of California, Case No. 205525, February, 2000. (Engaged by Bahram Saghari, recover and analyze computer source code and computer based evidence)

- Admitted as an expert on computer software development in *Novinger v. TRW et al.*, U.S. District Court for the District of Oregon, Case No. CV96-286-JE, July, 1998. (Engaged by Novinger, to review software and data management practices relating to an identity theft case)

Arbitration Testimony

- Judicial Arbitration and Mediation Services, Inc. (JAMS), *Chrome Systems, Inc. v. Autodata Solutions, Inc., et al.* (Case No. 11808-VCG), JAMS Reference No. 1340012931; September 2016 (Engaged by Autodata Solutions (defendant) for copyright dispute)

- *In the Matter of the Companies' Creditors Arrangement Act, R.S.C. 1985, c.C.36, as Amended And in the Matter of a Plan or Arrangement of Nortel Networks Corporation, Nortel Networks Limited, Nortel Networks Global Corporation and Nortel Networks Technology Corporation*, (discovery hearing ordered by) Ontario Superior Court of Justice, Court File No. 09-CL-7950 (Engaged by SNMP Research International and SNMP Research, Inc. for analysis of technical materials and discovery issues)

- Judicial Arbitration and Mediation Services, Inc. (JAMS), *The Clearing Corporation v. The Chicago Merchantile Exchange, Inc.*, Case No. 06CH10553, April 2008 (Engaged by The Clearing Corporation relating to breach of license/copyright dispute.)

- Judicial Arbitration and Mediation Services, Inc. (JAMS), *Polimaster Ltd and NA&SE Trading Co., Limited and RAE Systems, Inc.*, Case No. 1110009296, March 2007 (Engaged by RAE Systems, Inc. to analyze software relating to copyright, trade secret, and reverse engineering allegations.)

- International Commercial Arbitration Act, *MPI Technologies, Inc., and Xerox Canada, Ltd and Xerox Corporation*, January 2005 (Engaged by MPI Technologies to analyze computer software and evidence relating to a breach of license/copyright dispute.)

- American Arbitration Association, *Bionic Buffalo Corporation v. Integrated Systems, Inc. and WindRiver Systems, Inc.*, Case No. 79 117 0011299, February 2002. (Engaged by Integrated Systems, Inc. to analyze computer software and evidence relating to a breach of contract/copyright dispute.)

- American Arbitration Association, *Rollins, Inc., v. ALE Systems,* Case No. AAA30 181 00081 98, June, 1999 and August 1999. (Engaged by Rollins, Inc., to analyze computer software and evidence relating to a breach of contract/failed software development dispute.)

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Curriculum Vitae, Qualifications, Testimony   Qualifications: 13

Deposition Testimony

- US District Court for the Western District of Texas, Austin Division; *UMG Recordings, Inc., et al. v. Grande Communications Networks LLC and Patriot Media Consulting, LLC*; Case No. 1:17-cv-00365; October 2018

- US District Court District of Nevada, *Rimini Street, Inc. v. Oracle International Corporation; Oracle America Inc., Oracle International Corporation v. Rimini Street, Inc., Seth Ravin*; Case No. 2:14-cv-01699-LDG-VCF; September 2018

- US District Court Northern District of California, *Foresee Results, Inc., Answers Corporation v. Auryc, Inc., Auryc LLC, Jinlin Wang, Feng Shao, Amod Setlur and Does 1 through 20*; Case No. 3:17-cv-06973-RS; September 2018

- U.S. District Court Southern District of New York, *RELX, Inc. v. Informatica Corp*, Case No. 1:16-cv-9718-AKH; June 2018

- In the Circuit Court of the 17th Judicial Circuit in and for Broward County, Florida, Complex Business Division, *Flexible Business Systems, Inc. v. Seacor Island Lines LLC and Seacor Holdings Inc.*; Case No. 15-006350 CACE (07); February 2018

- US Bankruptcy Court for the District of Delaware, *In re Nortel Networks, Inc.*, Bankr Case No. 09-10138(KG); *SNMP Research International, Inc., and SNMP Research, Inc. vs. Nortel Networks, Inc., et al. and Avaya, Inc.*; Case Adv Proc. No. 11-53454(KG); February 2017

- US District Court for the District of Delaware, *Avaya, Inc. v. SNMP Research Inc.*, Case No. 12-191-RGA; January 2016

- US District Court for the Southern District of California, *Anthony Johnson v. Storix, Inc.*, Case No. 14-CV-1873-H-BLM; October 2015

- US District Court for the Eastern District of Virginia, *BMG Rights Management(US) LLC, and Round Hill Music LP v. Cox Enterprises, Inc., Cox Communications, Inc., CoxCom, LLC*, Case No. 1:14-cv-1611(LOG/JFA); August 2015

- US District Court for the Northern District of California San Francisco Division, *Fujifilm Corporation v. Motorola Mobility LLC*, Case No. C12-03587 RS; November 2014

- US District Court for the Eastern District of New York; *Point 4 Data Corporation and Dynamic Concepts, Inc. v. Tri-State Surgical Supply & Equipment, Ltd., SJ Computers, Inc., and Shmuel Judkovitz*, Case No. 11 CV 0726 (RJD); June 2012

- US District Court for the District of Delaware; Finjan, Inc. v. McAfee, Inc., Symantec Corp., Webroot Software, Inc., Websense Inc., and Sophos, Inc., Case No. 10-593-GMS; June 2012 (Engaged by defendant Websense Inc.; patent infringement)

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Curriculum Vitae, Qualifications, Testimony   Qualifications: 14

- US District Court for the Eastern District of Louisiana; *Sean Bowie v. The New Orleans Public Belt Railroad Commission, d/b/a New Orleans Public Belt Railroad Company*, Case No. 11-00755; June 2012

- US District Court for the Central District of California, Southern Division; *Bryan Pringle v. William Adams, Jr., et al.*, Case No. SACV10-1656 JST (RZx); January 2012 (Engaged by plaintiff to address issues related to spoliation and copyright infringement allegations)

- In the District Court of Bexar County, Texas, 407th Judicial District; *Karen Griffin v. Union Pacific Railroad Company*, et al., Cause No. 2010-CI08523; December 2011 (Engaged by plaintiffs in the context of a railroad case requiring analysis of TIR (Track Image Recorder) video)

- US District Court for the Western District of Pennsylvania, *University of Pittsburgh of the Commonwealth System of Higher Education dba University of Pittsburgh v. Varian Medical Systems, Inc.*; Case No. 2:08-cv-01307, September 2011 (Engaged by University of Pittsburgh; patent infringement)

- US District Court for the Eastern District of Virginia, Norfolk Division, *ActiveVideo Networks, Inc. v. Verizon Communications, Inc., Verizon Services Corp., Verizon Virginia, Inc., and Verizon South Inc.*; Case No. 2:10-cv-248-RAJ-FBS, June 2011 (Engaged by ActiveVideo Networks, Inc. ; patent infringement)

- U.S. District Court for the Eastern District of Texas, Tyler Division, *Clear With Computers, LLC. v. Hyundai Motor America, Inc.*, Case No. 6:09-cv-479 LED, April 2011 (Engaged by Hyundai Motor America, Inc.; patent infringement suit.)

- In the Circuit Court of the 11th Judicial Circuit, In and For Miami-Dade County, Florida, General Jurisdiction Division, *Jarrell Cannon a minor by and through his mother and natural guardian, Alicia Lott, and Alicia Lott, individually v. Ford Motor Company, and Hazel Edgecomb*, Case No. 05-21648 CA20, March 2011 (Engaged by plaintiffs in the context of technical issues in discovery)

- U.S. District Court for the Eastern District of Texas, Tyler Division, *Clear With Computers, LLC. v. Hyundai Motor America, Inc.*, Case No. 6:09-cv-479 LED, March 2011 (Engaged by Hyundai Motor America, Inc. patent infringement suit.)

- In the Circuit Court of Cook County, Illinois, County Department-Chancery Division, *Citadel Investment Group, v. Teza Technologies, LLC, et al.*, Case No. 09 CH 22478, July 2010. (Engaged by Teza Technologies to verify effectiveness of clean room protocol.)

- U.S. District Court for the District of Oregon, *CollegeNet, Inc. v. XAP Corporation*, Case No. 03-1229-BR, April 2008. (Engaged by XAP Corporation, to analyze computer software in the context of a patent infringement suit.)

- U.S. District Court for the Western District of Wisconsin, *Extreme Networks, Inc. v. Enterasys, Inc.*, Case No. 07-C-0229-C, February 2008. (Engaged by Enterasys, Inc., patent infringement.)

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Curriculum Vitae, Qualifications, Testimony	Qualifications: 15

- U.S. District Court for the Eastern District of Texas, Lufkin Division, *Grantley Patent Holdings, Ltd. v. Clear Channel Communications, Inc.*, et al; Case No. 9:06cv259, February 2008 (Engaged by Grantley Patent Holdings, Ltd., patent infringement.)

- U.S. District Court for the Western District of Wisconsin, *Extreme Networks, Inc. v. Enterasys, Inc.*, Case No. 07-C-0229-C, January 2008. (Engaged by Enterasys, Inc., patent infringement.)

- U.S. District Court Northern District of California San Jose Division, *Creative Science Systems, Inc. v. Forex Capital Markets LLC and REFCO Group Ltd., LLC*, Case No. C04-03746 JF (RS), September 2006. (Engaged by Forex Capital Markets to perform analysis in the context of a software licensing dispute.)

- U.S. District Court Northern District of Minnesota, *Ricoh Corporation and Ricoh Company, Ltd. v. Pitney Bowes, Inc.*, Case No. 02-5639 (GEB), August 2006. (Engaged by Pitney Bowes Inc., patent infringement.)

- U.S. District Court Northern District of Illinois Eastern Division, *HotSamba, Inc. v. Caterpillar, Inc.*, Case No. 01-C-5540, July 2006. (Engaged by Caterpillar Inc.)

- U.S. District Court for the District of Oregon, *CollegeNet, Inc. v. XAP Corporation*, Case No. 03-1229-BR, March 2006. (Engaged by XAP Corporation, to analyze computer software in the context of a patent infringement suit.)

- U.S. District Court Northern District of California San Jose Division, *Creative Science Systems, Inc. v. Forex Capital Markets LLC and REFCO Group Ltd., LLC*, Case No. C04-03746 JF (RS), March 2006. (Engaged by Forex Capital Markets to perform analysis in the context of a software licensing/copyright dispute.)

- U.S. District Court Central District of California Western Division, *Imax Corporation and Three-Dimensional Media Group, Ltd. V. In-Three, Inc.*, Case No. CV-05-1795 (Mcx), August 2005. (Engaged by In-Three, Inc., to perform analysis of computer software relating to patent validity and prior art.)

- Superior Court of the State of California, County of San Diego, *Del Mar Datatrac, Inc. v. ProLender Solutions, Inc., et al.,* Case No. GIC 817717, June 2004 (Engaged by Del Mar Datatrac, to analyze computer software in the context of a trade secret/copyright case and oversight of subsequent software production to verify effectiveness of clean room procedures used during remediation.)

- U.S. District Court Northern District of California Oakland Division, *Compuware Corporation v. International Business Machines*, Case No. 02-70906, May 2003, June 2003, June 2004, and January 2005. (Engaged by Compuware Corporation to perform analysis of computer software and software development efforts in the context of a copyright/trade secret dispute.)

- U.S. District Court Northern District of California Oakland Division, *VMware, Inc. v. Connectix Corporation and Microsoft Corporation*, Case C03 00654 CW,

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Curriculum Vitae, Qualifications, Testimony   Qualifications: 16

April 2003. (Engaged by Connectix Corporation, to perform analysis of computer software and potential prior art in the context of a patent dispute.)

- U.S. District Court for the Eastern District of Virginia, Alexandria Division, *Washington Post. Newsweek Interactive Company, LLC., et al v. The Gator Corporation*, Case No. 02-909-A, December 2002. (Engaged by The Gator Corporation for analysis of computer software and computer-based evidence relating to a dispute involving pop-up advertisements.)

- Franklin County Circuit Court, *Norman B. Feaster et al. v. CSX Transportation, Inc., et al.*, Franklin County Circuit Court Case No. 10,913-CV, November 2002. (Engaged by Norman B. Feaster, et al. in the context of a railroad case requiring analysis of locomotive event recorder data.)

- The Superior Court Of The State Of California, *Tim O'Neil v. Levi Strauss and Company, Earnest "Hap" Wheale, Katy Basile, Ruth Meyler, and DOES 1 through 100*, Case No. 305531, January 2001. (Engaged by Levi Strauss and Company, recover and analyze computer based evidence.)

- U.S. District Court for the Northern District of Illinois, Eastern Division, *Chris-Craft Industrial Products, Inc. v. Kuraray Company, Ltd., Kuraray America, Inc. Cast Film Technology, Inc. and James R. Rossman*, Case No. 98 CV 7298. (Engaged by Chris-Craft to recover and analyze data related to trade secret misappropriation.)

- U.S. District Court for the District of Oregon, *Novinger v. TRW*, Case No. CV96-286-JE. (Engaged by Novinger, to analyze computer software and data management practices relating to an identity theft case.)